EXHIBIT 4

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION

BLUE SPIKE, LLC *Plaintiff,* v. TEXAS INSTRUMENTS, INC. *Defendants*	§ § § § § § § §	Civil Action No. 6:12-CV-499 MHS LEAD CASE

BLUE SPIKE, LLC *Plaintiff,* v. AUDIBLE MAGIC CORPORATION, FACEBOOK, INC., MYSPACE, LLC, SPECIFIC MEDIA, LLC, PHOTOBUCKET.COM, INC., DAILYMOTION, INC., DAILYMOTION S.A., SOUNDCLOUD, INC., SOUNDCLOUD LTD., MYXER, INC., QLIPSO, INC., QLIPSO MEDIA NETWORKS LTD., YAP.TV, INC., GOMISO, INC., IMESH, INC., METACAFE, INC., BOODABEE TECHNOLOGIES, INC., TUNECORE, INC., ZEDGE HOLDINGS, INC., BRIGHTCOVE INC., COINCIDENT.TV, INC., ACCEDO BROADBAND NORTH AMERICA, INC., ACCEDO BROADBAND AB, AND MEDIAFIRE, LLC *Defendants.*	§ §	Civil Action No. 6:12-CV-576 MHS CONSOLIDATED CASE **HIGHLY CONFIDENTIAL – ATTORNEYS EYES ONLY**

EXPERT REPORT OF DR. SCHUYLER QUACKENBUSH

anticipated or obvious. Furthermore, all of the dependent asserted claims of the asserted patents are invalid as either anticipated or obvious.

35. In my professional opinion, the claims of the asserted patents are invalid, as the patent specification does not provide a sufficient disclosure so that a person of ordinary skill in the art, after reading the specification, could practice the claimed invention without undue experimentation.

36. In my professional opinion, the disclosure of the asserted patents does not reasonably convey to those of ordinary skill in the art that the inventor had possession of the claimed subject matter as of the filing date. Further, the specification does not describe an invention understandable to one of ordinary skill in the art or show that the inventor actually invented the invention claimed.

37. In my professional opinion, the claims of the asserted patents do not particularly point out and distinctly claim the subject matter that is regarded as the invention, because a person of ordinary skill in the art would not understand what is claimed in light of the specification. In my professional opinion, the terms “abstract,” “similar to,” “index of relatedness,” and “data describing a portion of the characteristics of its associated reference signal,” “programmed or structured to use an/said algorithm…” are terms whose meaning cannot be ascertained, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention, are not amenable to construction, and are insolubly ambiguous. I have reviewed and adopted the analysis and conclusions in the Expert Declaration of John Snell in this regard.

38. In my opinion the asserted patents are invalid because Moskowitz “did not himself invent the subject matter to be patented” as stated in 35 U.S.C. § 102(f), but instead derived the invention from and did not name in the original application, the following

individuals: Thom Blum, Erling Wold, Doug Keislar and Jim Wheaton.

VI. LEVEL OF ORDINARY SKILL IN THE ART

39. The Court ruled "that a person of ordinary skill in the art would have at least a Bachelor's degree in electrical engineering, computer science, or equivalent degree, with a background and at least two years' experience in signal processing, image processing, biometric identification, or a related field." [Markman Order, Docket 1831, p. 9 affirmed at Docket 1894].

VII. LEGAL PRINCIPLES RELATED TO INVALIDITY

40. I am not an attorney and I will not testify as to legal opinions. For purposes of this report, I am assuming the following legal principles.

A. Anticipation

41. I understand that a patent claim is invalid if the claimed invention is not new. For a claim to be invalid on the basis of anticipation because it is not new, all of its requirements must be present, either expressly or inherently, in a single previous device or method, or described, either expressly or inherently, in a single previous publication or patent. I have read 35 U.S.C. §§ 102(a), 102(b), 102(e), and 102(g), and I have an understanding of the requirements to prove anticipation of a patented invention under those statutory provisions.

42. I have been informed that a patent claim is invalid under 35 U.S.C. § 102(a) if the invention defined by the claim was known or used by others in the United States or was patented or described in a printed publication, such as a journal, magazine or newspaper article, anywhere in the world before the applicants' invention date. I understand that a printed publication, such as an article published in a magazine or trade publication, constitutes prior art to a claimed invention under 35 U.S.C. § 102(a) if the publication takes place prior to the date of invention. I understand that a U.S. patent constitutes prior art to a claimed invention under 35 U.S.C. § 102(a) if the date of issuance of the patent is before the date of invention.

invention achieved any unexpected results; (6) whether or not the invention was praised by others; (7) whether or not others have taken licenses to use the invention; (8) whether or not experts or those skilled in the art at the making of the invention expressed surprise or disbelief regarding the invention; (9) whether or not products incorporating the invention have achieved commercial success and (10) whether or not others having ordinary skill in the field of the invention independently made the claimed invention at about the same time the inventor made the invention.

66. I understand that the U.S. Supreme Court's opinion in *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007) ("KSR"), articulates the standard for finding a patent claim invalid for obviousness. In KSR, I understand that the Supreme Court held that the Graham Factors control the obviousness inquiry, and that the combination of known elements is obvious if: "there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." I also understand that the Supreme Court set forth several non-exclusive reasons that a patent claim of a combination of known elements may be obvious, including if it claims:

> the "combination of familiar elements according to known methods...[that] does no more than yield predictable results";
>
> a "predictable variation" of a work from another field of endeavor; or
>
> a solution that was "obvious to try" because there were a finite number of identified, predictable solutions at the time of invention.

C. <u>Prior Inventorship</u>

67. I understand that under 35 U.S.C. § 102(f), a patent is invalid if the named inventor "did not himself invent the subject matter sought to be patented." I understand that this provision requires that the patent "accurately list the correct inventors of a claimed invention." *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1349 (Fed. Cir. 1998). That is, if all inventors are not accurately named, the patent is invalid. I have further been informed that all that is required for

an individual to be a joint inventor is that he or she:

> (1) contribute in some significant manner to the conception or reduction to practice of the invention, (2) make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention, and (3) do more than merely explain to the real inventors well known concepts and/or the current state of the art.

Id. at 1351. I understand that if any individual satisfies these three requirements and is not named as an inventor on the patent, the patent is invalid.

D. Indefiniteness

68. I have been informed and understand that a patent claim must particularly point out and distinctly claim the subject matter that is regarded as the invention. Further, I have been informed and understand that this definiteness requirement is met only if one skilled in the art would understand what is claimed in light of the specification. I further understand that a patent claim is invalid if the claim does not satisfy the definiteness requirement.

69. I have further been informed and understand that a claim whose meaning cannot be ascertained may be invalid as indefinite under 35 U.S.C. § 112, second paragraph. Claims are not indefinite if the meaning of the claim is discernable, even though the conclusion over claim meaning may be one in which reasonable persons disagree. I understand that claims may only be found indefinite if they fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention, or are not amenable to construction, or are insolubly ambiguous. If the claim is subject to construction and can be given any reasonable meaning, it is not indefinite.

E. Lack of Written Description

70. I have been informed and understand that a patent specification must contain a written description of the invention. I further understand that the test for determining if the written description requirement is satisfied is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the

construction provided by the court in my analysis put forth in this report.

P. The Prior Invention of Thom Blum, Erling Wold, Doug Keislar and Jim Wheaton

5743. It is also my opinion that the asserted patents are invalid because Moskowitz "did not himself invent the subject matter to be patented" as stated in 35 U.S.C. § 102(f). The patents are further invalid because the following individuals were not named in the original application: Thom Blum ("Blum"), Erling Wold ("Wold"), Doug Keislar ("Keislar") and Jim Wheaton ("Wheaton"). While it is my opinion, as explained in detail above, that the prior art renders each of the asserted patents invalid as anticipated or obvious, the patents are further invalid, even separately from the disclosures of the prior art, because Moskowitz and Berry did not conceive many of the inventions claimed in the asserted patents. Many of the ideas disclosed and claimed in the asserted patents were conceived by Blum, Wold, Keislar or Wheaton. Indeed, it is my opinion that the key idea set forth in the claims, a representation of signal based on "perceptual" features, and related implementation details, originated with Blum, Wold, Keislar and Wheaton.

5744. I understand that the following are facts proven by cited documents. I note that the named inventor Scott Moskowitz was in communication with the Muscle Fish inventors prior to the filing of the Blue Spike patents. I have reviewed 1997 documents and testimony in which Mr. Moskowitz was aware of the Muscle Fish AIR DataBlade product (containing Muscle Fish's CBR technology) and he referred to that as the "proprietary" technology of Muscle Fish and indicated that he wished to work with Muscle Fish on future "extension" projects. [BLU013491, BLU0230166, BLU13499] I have reviewed documents between 1996 and 2000 describing the Muscle Fish CBR technology as assessing the similarity of sound based on analysis of "perceptual" features of the sound, and I have reviewed testimony of Mr. Moskowitz that he was aware of such material. [Moskowitz Depo., 710:19-715:20] Mr. Moskowitz also indicated that

he was familiar with the initial Muscle Fish article Erling Wold et al., *Content-Based Classification, Search, and Retrieval of Audio*, 3 IEEE Multimedia 27 (1996). [Moskowitz Depo., 680:19-681:7 and Exhibit 17]

5745. I note that there are many instances of similar terminology between the prior art publications and systems by Blum, Wold, Keislar and Wheaton and the asserted Blue Spike patents. There are a number of very specific terms and nomenclature and very specific principles which are found in the asserted patents. It is my opinion that it is notable and would be unusual for this specific combination of terms, nomenclature and principles to be found both in the earlier Muscle Fish prior art publications and systems and in the later asserted patents, filed on September 7, 2000, unless the authors of the asserted patents had access to information concerning the earlier Muscle Fish prior art and had adopted some of the Muscle Fish terms, nomenclature and principles in the asserted patents. The following chart outlines specific examples of Muscle Fish terms, nomenclature and principles that appear to have been known to the authors of the asserted patents and adopted in the asserted patents:

Blue Spike Patent Filed 9/7/2000	***Muscle Fish Prior Art Technology 1996, 1997, 1998***
"perceptual features"	
'472 Patent, 8:41-54: "The third element is the feature selector, which is able to analyze a selected object and identify perceptual features of the object that can be used to uniquely describe the selected object. Ideally, the feature selector can identify all, or nearly all, of the perceptual qualities of the object that differentiate it from a similarly selected object of other signals. Simply, a feature selector has a direct relationship with the perceptibility of features commonly observed. Counterfeiting is an activity which specifically seeks out features to misrepresent the authenticity of any given object. Highly granular, and arguably successful, counterfeiting is typically sought	Wold et al. "Content-Based Classification, Search and Retrieval of Audio": "We believe there are several useful methods, all of which we have attempted to incorporate into our system… *Acoustical/perceptual features*: describing the sounds in terms of commonly understood physical characteristics such ass brightness, pitch, and loudness." [Moskowitz Depo., Exhibit 17, pg. 2] Muscle Fish CBR technology at BLU0136699: "Muscle Fish Content-based classification, search and retrieval of audio. Muscle Fish's CBR (content-based retrieval) technology

for objects that are easily recognizable and valuable, for example, currency, stamps, and trademarked or copyrighted works and objects that have value to a body politic." '472 Patent, Claim 1: "1. A method for monitoring and analyzing at least one signal comprising: receiving at least one reference signal to be monitored; creating an abstract of said at least one reference signal wherein the step of creating an abstract of said at least one reference signal comprises: inputting the reference signal to a processor; creating an abstract of the reference signal using perceptual qualities of the reference signal such that the abstract retains a perceptual relationship to the reference signal from which it is derived; storing the abstract of said at least one reference signal in a reference database; receiving at least one query signal to be analyzed; creating an abstract of said at least one query signal wherein the step of creating an abstract of said at least one query signal comprises: inputting the at least one query signal to the processor; creating an abstract of the at least one query signal using perceptual qualities of the at least one query signal such that the abstract retains a perceptual relationship to the at least one query signal from which it is derived; and comparing the abstract of said at least one query signal to the abstract of said at least one reference signal to determine if the abstract of said at least one query signal matches the abstract of said at feast one reference signal."	allows you to search for audio files on the basis of how they sound. It can also be used to classify sound files or live sound inputs. How might people want to access sounds? We believe there are several useful methods, all of which we have attempted to incorporate into our system. - Simile: saying one sound is like another sound or a group of sounds in terms of some characteristics. For example, "like the sound of a herd of elephants." A simpler example would be to say that it belongs to the class of speech sounds or the class of applause sounds, where the system has previously been trained on other sounds in this class. Acoustical/perceptual features: describing the sounds in terms of commonly understood physical characteristics such as brightness, pitch, and loudness. - Subjective features: describing the sounds using personal descriptive language. This requires training the system (in our case, by example) to understand the meaning of these descriptive terms. For example, a user might be looking for a "shimmering" sound. - Onomatopoeia: making a sound similar in some quality to the sound you are looking for. For example, the user could making a buzzing sound to find bees or electrical hum. In a retrieval application, all of the above could be used in combination with traditional keyword and text queries." http://www.musclefish.com [Moskowitz Depo., Exhibit 12] '223 Patent, 3:34-46: "This invention allows users to search the sound file database by four specific methods, enumerated below. The result of these searches is a list of sound files rank-ordered by distance from the specified N-vector, which corresponds to sound-files which are most similar to the specified N-vector. 1) Simile: asking for sounds which are similar to an example sound file, or a list of example sound files. 2) Acoustical/perceptual features: asking for

	sounds in terms of commonly understood physical characteristics, such as brightness, pitch and loudness." AIR DataBlade, June 1997 User Guide: feature vectors could reflect: "Perceptual attributes, such as pitch or loudness." [AUDMAG01092705] A March 1997 AIR DataBlade document: "the AIR DataBlade… enables database applications to automatically analyze and translate raw audio data into a perceptually meaningful form that can be stored in tables…. With the AIR DataBlade module, sound files are automatically analyzed for acoustic-perceptual and file attributes when inserted into the database. The analysis data, or 'feature vector,' consists of less than a kilobyte of information, regardless of the duration of the original sound. This vector is always added to the database. Copying the sound file itself into the database is optional.… "[a]nalyze and store acoustic and perceptual features of a sound related to pitch, loudness, tone, and temporal qualities." [AUDMAG00064676-77] CBR Technology, July 1999: "Audio Feature Vector" is a "compact perceptual signature for a sound or sound segment." "Sigantures may be compared for perceptual similarity." [AUDMAG01067957-980]
"subjective" features	
'700 Patent, Claim 8: "The system of claim 7, wherein the characteristics of the reference signal being described comprise at least one of a perceptible characteristic, a cognitive characteristic, a subjective characteristic, a perceptual quality, a recognizable characteristic or combinations thereof '494 Patent, Claim 18: "The system of claim 17, wherein the characteristics of the reference	Wold et al. Content-Based Classification, Search and Retrieval of Audio: "We believe there are several useful methods, all of which we have attempted to incorporate into our system… *Subjective features*: describing the sounds using personal descriptive language. This requires training the system (in our case, by example) to understand the meaning of these descriptive terms." [Moskowitz Depo., Exhibit 17, pg. 2]

signal being described comprise at least one of a perceptible characteristic, a cognitive characteristic, a subjective characteristic, a perceptual quality, a recognizable characteristic or combinations thereof.	Muscle Fish CBR technology at BLU0136699: "Muscle Fish Content-based classification, search and retrieval of audio. Muscle Fish's CBR (content-based retrieval) technology allows you to search for audio files on the basis of how they sound. It can also be used to classify sound files or live sound inputs. How might people want to access sounds? We believe there are several useful methods, all of which we have attempted to incorporate into our system. - Simile: saying one sound is like another sound or a group of sounds in terms of some characteristics. For example, "like the sound of a herd of elephants." A simpler example would be to say that it belongs to the class of speech sounds or the class of applause sounds, where the system has previously been trained on other sounds in this class. Acoustical/perceptual features: describing the sounds in terms of commonly understood physical characteristics such as brightness, pitch, and loudness. - Subjective features: describing the sounds using personal descriptive language. This requires training the system (in our case, by example) to understand the meaning of these descriptive terms. For example, a user might be looking for a "shimmering" sound. - Onomatopoeia: making a sound similar in some quality to the sound you are looking for. For example, the user could making a buzzing sound to find bees or electrical hum. In a retrieval application, all of the above could be used in combination with traditional keyword and text queries." http://www.musclefish.com [Moskowitz Depo., Exhibit 12] '223 Patent, 3:34-51: This invention allows users to search the sound file database by four specific methods, enumerated below. The result of these searches is a list of sound files rank-ordered by distance from the specified N-vector, which corresponds to sound-files which are most similar to the specified N-vector.

	…. 3) Subjective features: asking for sounds using individually defined classes. For example, a user might be looking for a sound which is both "shimmering" and "rough", where the classes "shimmering" and "rough" have been previously defined by a set of appropriate examples. AIR DataBlade, June 1997 User Guide: feature vectors could reflect: "Subjective attributes, such as scratchy or brassy sounds." [AUDMAG01092705]
"audio objects"	
'472 Patent, 8:31-40: The second element is the object locator, which is able to segment a portion of a signal being monitored for analysis (i.e., the "monitored signal"). The segmented portion is also referred to as an "object." As such, the signal being monitored may be thought of comprising a set of objects. A song recording, for example, can be thought of as having a multitude of objects. The objects need not be of uniform length, size, or content, but merely be a sample of the signal being monitored. Visually communicated informational signals have related objects; color and size are examples.	Wold et al. Content-Based Classification, Search and Retrieval of Audio: "Users accustomed to searching, scanning, and retrieving text data can be frustrated by the inability to look inside the audio objects." [Moskowitz Depo., Exhibit 17, pg. 1] '223 Patent, 1:23-31: "audio is usually treated as an opaque collection of bytes with only the most primitive database fields attached: name, file format, sampling rate and so on. Users who are accustomed to searching, scanning and retrieving text data can be frustrated by the inability to look inside the audio objects." AIR DataBlade Manual: "Weights The AIR DataBlade module enables you to indicate the relative importance, or weight, of measured parameters in a comparison. For example, when you compare two audio objects, if duration is more important than pitch, you indicate this by giving duration a larger relative weight in the comparison." [AUDMAG01092705]
"segmentation"	
'472 Patent, 8:31-40: "The second element is the object locator, which is able to segment a portion of a signal being monitored for analysis	Wold et al. Content-Based Classification, Search and Retrieval of Audio: "Segmentation The discussion above deals with the case

(i.e., the "monitored signal"). The segmented portion is also referred to as an "object." As such, the signal being monitored may be thought of comprising a set of objects. A song recording, for example, can be thought of as having a multitude of objects. The objects need not be of uniform length, size, or content, but merely be a sample of the signal being monitored. Visually communicated informational signals have related objects; color and size are examples."	where each sound is a single gestalt. Some examples of this would be single short sounds, such as a door slam, or longer sounds of uniform texture, such as a recording of rain on cement. Recordings that contain many different events need to be segmented before using the features above. Segmentation is accomplished by applying the acoustic analyses discussed to the signal and looking for transitions (sudden changes in the measured features). The transitions define segments of the signal, which can then be treated like individual sounds. For example, a recording of a concert could be scanned automatically for applause sounds to determine the boundaries between musical pieces. Similarly, after training the system to recognize a certain speaker, a recording could be segmented and scanned for all the sections where that speaker was talking." [Moskowitz Depo., Exhibit 17, pg. 8]
"data reduced" representations	
'472 Patent, 10:9-16: "As a general improvement over the art, the present invention incorporates what could best be described as "computer-acoustic" and "computer-visual" modeling, where the signal abstracts are created using data reduction techniques to determine the smallest amount of data, at least a single bit, which can represent and differentiate two digitized signal representations for a given predefined signal set. Each of such representations must have at least a one bit difference with all other members of the database to differentiate each such representation from the others in the database."	Wold et al. Content-Based Classification, Search and Retrieval of Audio: "To accomplish any of the above methods, we first reduce the sound to a small set of parameters using various analysis techniques." [Moskowitz Depo., Exhibit 17, pg. 2] CBR Technology, July 1999: "Audio Feature Vector" is a "compact perceptual signature for a sound or sound segment." [AUDMAG01067957-980]
"reference" abstract/fingerprint - "reference database"	
'472 Patent, Abstract: "A method and system for monitoring and analyzing at least one signal are disclosed. An abstract of at least one reference signal is generated and stored in a reference database."	March 30, 2000 Audible Magic business plan: "Audible Magic Corporation is a Silicon Valley startup focused on providing enabling technologies and solutions to help businesses monetize audio content (especially music). The company possesses proprietary technology that can be used to match an unidentified song to

	the title, artist, and album on which it appears. This technology operates by digitally processing the audio and producing a unique 'fingerprint', which can be matched against a database of known fingerprints. The advantage of this technique is that it is not reliant on encoded meta-data and it can identify audio no matter what the source or format (streaming, downloaded, radio tuner, or CD). This feature allows the technology to be used in a wide variety of applications and provides a standard mechanism to identify audio content in real-time without the need for participation of the content source or broadcaster. . . . . 2.0 How It Works - Audible Magic Technology Overview The technology is based upon a U.S. patent (#5,918,223) granted in 1999 to a company Audible Magic is in the process of acquiring. The actual software is a collection of ANSI C library functions that perform a range of tasks used to process the audio: Audio Feature Extraction – This function generates a Feature Vector, which is numeric metadata that describes the acoustic/perceptual properties of the audio signal. These include loudness, pitch, spectral and cepstral content, rhythm, tempo, and other statistical measures of these acoustic properties. Similarity Measurement – This function is used to compare, organize, and order sounds by their perceptual qualities. These measures can be used to perform queries such as 'find a sound like this one'. Segmentation – This function is used to programmatically break a sound up into smaller pieces. This can be used to find audio scene changes, for example. Classification – This function can be used to determine whether a sound is speech or music, or from a particular sound source, or whether it

	was recorded indoors or out-of-doors, for example. Event Recognition – This function can be used to recognize sounds in an ongoing stream of sounds. For example, a referee's whistle in a basketball game. Fundamentally, the software allows for audio classification and retrieval based upon the content itself. To quote from the abstract of the patent: "A system that performs analysis and comparison of audio data files based upon the content of the data files is presented. The analysis of the audio data produces a set of numeric values (a feature vector) that can be used to classify and rank the similarity between individual audio files typically stored in a multimedia database or on the World Wide Web. The analysis also facilitates the description of user defined classes of audio files, based on an analysis of a set of audio files that are members of a user-defined class. The system can find sounds within a longer sound, allowing an audio recording to be automatically segmented into a series of shorter audio segments." Its use in the application of identifying music consists of the following steps: 1. A digital sound file or stream is segmented into multiple segments of fixed length and overlap. 2. Each segment is processed and a Feature Vector is produced which consists of a series of measurements characterizing that segment of sound. The series of Feature Vectors is referred to as a Fingerprint. This fingerprint is typically less than 180K in size for a three minute audio file. This contrasts with a three minute WAV file being approximately 30Mb. 3. These 'reference' fingerprints are stored in a database using proprietary indexing to speed retrieval.

	4. When an unknown sound file is presented, the same process of segmentation, Feature Vector processing, and fingerprint creation is performed. This unknown fingerprint is then matched against the reference database of fingerprints to identify it. Once the fingerprint is matched, song title, artist, album name, and any other linked information can be retrieved.
"monitoring"	
'472 Patent, Abstract: "A method and system for monitoring and analyzing at least one signal are disclosed."	CBR Technology, July 1999: "audio monitoring." [AUDMAG01067957-980] CBR Technology, February 2000: "Broadcast monitoring This application monitors broadcasts using a database of pre-analyzed songs and commercials…" [AUDMAG00064787-801]

5746. Having reviewed the deposition testimony and documents described above, it is my opinion that the asserted patents share significant similarities in language with Muscle Fish's proprietary '223 patent, and associated IEEE article and with Muscle Fish's AIR DataBlade which Mr. Moskowitz referred to as "proprietary." It appears that, in their various communications, Blum, Wold, Keislar and Wheaton did more than merely explain to Moskowitz and Berry well-known concepts and/or the current state of the art. Hence, Moskowitz and Berry may not have invented the claimed subject matter, but rather Blum, Wold, Keislar and Wheaton appear to have made a significant contribution to the subject matter of the asserted patents.

Dated: March 2, 2015

Dr. Schuyler Quackenbush

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Dated: March 3, 2015

Dr. Schuyler Quackenbush